

# Numerical Propulsion System Simulation (NPSS) Version 1



2001 NASA Software of the Year Winner  
2001 NASA Turning Goals Into Reality Goal Award Winner

## TECHNOLOGY

NPSS V1 is a world-class propulsion system simulation tool that provides the user with unprecedented capability, levels of interoperability, and ease of use. It is an emerging U.S. standard for aerospace simulations.

## COMMERCIAL APPLICATION

- ◆ Unique Plug 'n Play Object Oriented Architecture Enables: Multi-Fidelity Analysis & Multi-Discipline Simulation; Increase Modeling Flexibility & Resolution of System Model; Protect Company Proprietary Code and Data; Distributed Collaborative Engineering
- ◆ NPSS V1 offers key technological advances in designing aircraft engines and enhancing the U.S. aerospace industry's competitiveness.

## SOCIAL / ECONOMIC BENEFIT

Currently, the average development cost for an engine is \$1 billion in the U.S. industry. The time-to-market is three to five years for a commercial engine and 10 years for a military engine. Using NPSS, one partner estimates a 55% reduction in the time to perform engine system simulation throughout the product life cycle. This translates into an annual savings to the U.S. aircraft industry of over \$50M/year from increased productivity. The reduced risk translates into increased safety for aeronautics and the human exploration of space.

## NPSS PARTNERS

General Electric Aircraft Engines, Pratt & Whitney, The Boeing Company, Honeywell, Rolls-Royce Corporation, Williams International, Teledyne Continental Motors-Turbine Engines, Arnold Engineering Development Center, Wright Patterson Air Force Base, and NASA Glenn Research Center



*Anything that needs to be simulated can be modeled by writing the needed components and using the NPSS architecture.*

## NASA and PARTNER USAGE

NPSS V1 is being used by NASA and partners in industry, government, & academia, including: Joint Strike Fighter Program, Ultra-Efficient Engine Technology, Engine Alliance, General Electric Aircraft Engines, Pratt & Whitney, Williams-International, Georgia Institute of Technology, Modern Technologies Corporation, NASA GRC Propulsion Systems Analysis Office, and Arnold Engineering Development Center of Department of Defense.